

**3. Remarks/Discussion of Issues**

***Claim Summary***

By the present Amendment, claims 5, 6, 12, 13 and 19 have been canceled, without prejudice and without disclaimer of the subject matter. Claims 1-4, 7-11, 14-18 and 20 have been amended (discussed below), and claims 21-23 have been submitted for the Examiner's consideration.

Claims 1-4, 7-11, 14-18 and 20-23 are pending in the application. Applicant respectfully submits that all pending claims are in condition for allowance.

***Amendments to the Specification***

By the present Amendment, the fourth paragraph beginning on page 9 of the Specification (lines 18-22) has been replaced with the amended paragraph to correct minor informalities. Applicant respectfully submits that no new matter has been introduced by the amendments.

***35 U.S.C. § 112 Rejection - Claims 1-20***

The Office Action of March 3, 2009, rejects claims 1-20 under 35 U.S.C. § 112, second paragraph, for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention, and specifically addresses claims 2, 5, 9, 12 and 16. *See Office Action, p. 2.*

By the present Amendment, claim 5 has been canceled and claims 2, 9, 12 and 16 have been revised, addressing the issues raised by the Examiner. Applicants submit that the rejection under 35 U.S.C. § 112, second paragraph, is therefore moot, and respectfully request withdrawal of the same.

**35 U.S.C. § 101 Rejection - Claims 8-14**

The Office Action of March 3, 2009, rejects claims 8-14 under 35 U.S.C. § 101, stating that the claims are directed to non-statutory subject matter. *See* Office Action, p. 3.

Without acquiescing to the rejection, Applicant has amended independent claim 8 (from which claims 9-14 depend) to further recite “*rendering the up sampled ultrasound image three-dimensional volumes into display data....*” Accordingly, claim 8 “transform[s] underlying subject matter (such as an article or materials) to a different state or thing,” as asserted by the Examiner. *See* Office Action, p. 3. In particular, claim 8 recites transforming up sampled ultrasound image three-dimensional volumes into display data. (Claim 10 further recites displaying the rendered display data.) This is consistent with *In re Bilski*, 545 F.3d 943, 88 U.S.P.Q.2d 1385 (Fed. Cir. 2008), in which the Federal Circuit references *In re Abele*, 684 F.2d 902 (CCPA 1982), in which graphically displaying “X-ray attenuation data provided in a two dimensional field by a computer tomography scanner” was sufficient transformation to satisfy the requirements of 35 U.S.C. § 101. *See* 545 F.3d at 962-63 (citing *Abele*, 684 F.2d at 908-09). “[T]he transformation of that raw data into a particular visual depiction of a physical object on a display was sufficient to render that more narrowly-claimed process patent-eligible.” *Id.*

Accordingly, Applicants respectfully request withdrawal of the rejection of claims 8-14 under 35 U.S.C. § 101.

**35 U.S.C. § 102 Rejections - Claims 1- 20**

The Office Action of March 3, 2009, rejects claims 1-20 under 35 U.S.C. § 102(b) as being anticipated by MOCHIZUKI (U.S. Patent No. 6,623,093). Applicant respectfully traverses the rejection for at least the reasons set forth herein.

Applicant relies at least on the following standards with regard to proper rejections under 35 U.S.C. § 102. Notably, anticipation requires that each and every element of the claimed invention be disclosed in a single prior art reference. *See, e.g., In re Paulsen*, 30 F.3d 1475, 31 USPQ2d 1671 (Fed. Cir. 1994); *In re Spada*, 911 F.2d 705, 15 USPQ2d 1655 (Fed. Cir. 1990); *W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303, 313

(Fed. Cir. 1983). Alternatively, anticipation requires that each and every element of the claimed invention be embodied in a single prior art device or practice. *See, e.g., Minnesota Min. & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992). For anticipation, there must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention. *See, e.g., Scripps Clinic & Res. Found. v. Genentech, Inc.*, 927 F.2d 1565, 18 USPQ2d 1001 (Fed. Cir. 1991).

Applicant's silence on certain aspects of the rejection is by no means a concession as to their propriety. Rather, because the applied art fails to disclose at least one feature of the claims, for at least the reasons discussed below, Applicant respectfully submits that the rejections are improper and should be withdrawn.

Claims 1-20

As an initial matter, the Office Action does not address claims by claim number or specific claim elements. Rather, the Office Action provides a narrative of what is allegedly disclosed by MOCHIZUKI, leaving Applicant in the precarious position of having to surmise that which may be considered by the Examiner to disclose the various elements. For example, the Office Action mentions "line interpolation section 23" and "frame interpolation section 30" in FIG. 1 of MOCHIZUKI, but does not state whether one or both of these elements allegedly discloses the "interpolator" of claims 1 and 15. Further, there is no discussion of the specific steps recited in the method claims (claims 8-14) or of the specific features recited in many dependent claims. Clearly, such uncertainty places Applicant in the prejudicial position of having to base a reply on potentially incorrect assumptions.

Therefore, Applicant respectfully submits that the rejection fails to comply with MPEP § 706, which states, in part:

The goal of examination is to clearly articulate any rejection early in the prosecution process so that the applicant has the opportunity to provide evidence of patentability and otherwise reply completely at the earliest opportunity (emphasis added).

The rejection likewise fails to comply with 37 CFR § 1.104(c)(2), which provides:

In rejecting claims for want of novelty or for obviousness, the examiner must cite the best references at his or her command. When a reference is complex or shows or describes inventions other than that claimed by the applicant, the particular part relied on must be designated as nearly as practicable. The pertinence of each reference, if not apparent, must be clearly explained and each rejected claim specified (emphasis added).

Accordingly, the Examiner has not established a *prima facie* case of anticipation with respect to the claims. Applicant respectfully submits that the rejection of claims 1-20 under 35 U.S.C. § 102(b) should be withdrawn. Further, in light of the failure of the Office Action to comply with MPEP § 706 and 37 CFR § 1.104(c)(2), if further rejections are provided in subsequent official communications, Applicant respectfully submits that such rejections cannot be made properly final.

Claim 1

Independent claim 1 recites, in part:

*“ ... an interpolator that interpolates three-dimensional volumes derived from three-dimensional ultrasound image data to obtain at least one interpolated three-dimensional volume, providing up sampled three-dimensional volumes; and a memory that stores at least one of the three-dimensional ultrasound image data and the up sampled three-dimensional volumes.”*

Applicant assumes for purposes of discussion that the Office Action is asserting that the “interpolator” is disclosed by the line interpolation section 23 and/or the frame interpolation section 30 in FIG. 1 of MOCHIZUKI. However, the line interpolation section 23 interpolates between two adjacent ultrasound beams within the scanning plane S (see, e.g., col. 9, lines 31-39), and the frame interpolation section 30 interpolates between two adjacent scanning planes (see, e.g., col. 10, lines 35-42). Beams within a scanning plane and scanning

planes are two dimensional, and would precede formation of three-dimensional volumes (i.e., based on three-dimensional coordinates X, Y, Z).

In comparison, claim 1 recites that the interpolator interpolates three-dimensional volumes derived from three-dimensional ultrasound image data to obtain at least one interpolated three-dimensional volume, providing up sampled three-dimensional volumes. MOCHIZUKI therefore does not disclose at least this feature.

Accordingly, for at least the reasons stated above, Applicant respectfully submits that claim 1 is allowable over MOCHIZUKI, and requests withdrawal of the rejection of claim 1 under 35 U.S.C. § 102(b).

Claim 8

Independent claim 8 recites, in part:

*“ ... creating up sampled ultrasound image three-dimensional volumes from three-dimensional ultrasound image data using interpolation; storing at least one of the three-dimensional ultrasound image data and the up sampled ultrasound image three-dimensional volumes; and rendering the up sampled ultrasound image three-dimensional volumes into display data, wherein creating the up sampled ultrasound image three-dimensional volumes comprises interpolating a plurality of three-dimensional volumes derived from the three-dimensional ultrasound image data to obtain at least one interpolated three-dimensional volume.”*

Applicant respectfully submits that MOCHIZUKI does not disclose each and every feature of claim 8, at least for substantially the same reasons discussed above with respect to claim 1. Accordingly, Applicant submits that claim 8 is allowable over MOCHIZUKI, and requests withdrawal of the rejection of claim 8 under 35 U.S.C. § 102(b).

Claim 15

Independent claim 15 recites, in part:

*“ ... an interpolator that interpolates three-dimensional objects derived from three-dimensional coordinates of ultrasound image data to obtain at least one interpolated three-dimensional object, providing up sampled three-dimensional objects; and a memory that stores at least one of the three-dimensional ultrasound image data and the up sampled three-dimensional objects. ”*

Claim 15 recites interpolation of three-dimensional objects derived from three-dimensional coordinates of ultrasound image data to obtain at least one interpolated three-dimensional object, rather than three-dimensional volumes derived from three-dimensional ultrasound image data, as recited in claim 1. *See, e.g.*, Specification, p. 5, lines 5-19. However, as discussed above with respect to claim 1, MOCHIZUKI similarly does not disclose interpolation of three-dimensional objects. Rather, the line interpolation section 23 interpolates between two adjacent ultrasound beams within the scanning plane S (*see, e.g.*, col. 9, lines 31-39), and the frame interpolation section 30 interpolates between two adjacent scanning planes (*see, e.g.*, col. 10, lines 35-42). Beams within a scanning plane and scanning planes are two dimensional, and which would precede formation of any three-dimensional objects.

Accordingly, for at least the reasons stated above, Applicant respectfully submits that claim 15 is allowable over MOCHIZUKI, and requests withdrawal of the rejection of claim 1 under 35 U.S.C. § 102(b).

Claims 2-4, 7, 9-11, 14, 16-18 and 20-23

With regard to claims 2-4, 7, 9-11, 14, 16-18 and 20-23, Applicant asserts that they are allowable at least because they depend, directly or indirectly, from independent claims 1, 8 and 15, respectively, which Applicant submits have been shown to be allowable over MOCHIZUKI, as well as in view of their additional recitations.

For example, claims 4 and 11 recite that interpolation of the three-dimensional volumes includes interpolating 2 three-dimensional volumes to 4 three-dimensional volumes,

interpolating 3 three-dimensional volumes to 4 three-dimensional volumes and interpolating 3 three-dimensional volumes to 5 three-dimensional volumes. Claim 15 similarly recites that interpolation of the three-dimensional objects includes at least one of interpolating 2 three-dimensional objects to 4 three-dimensional objects, interpolating 3 three-dimensional objects to 4 three-dimensional objects and interpolating 3 three-dimensional objects to 5 three-dimensional objects. Applicant respectfully submits that MOCHIZUKI does not disclose performing such interpolations. For example, FIG. 1 of MOCHIZUKI shows line interpolation section 23 performing interpolation of two beams to generate one additional (interpolated) beam.

***New Claims***

Newly submitted claims 21-23 effectively rewrite a portion of claims 4, 11 and 18, respectively, which were deleted. Therefore, since claims 21-23 depend from claim 1, 8 and 15, respectively, they are allowable for at least the reasons discussed with respect to claims 1, 8 and 15.

**Conclusion**

In view of the foregoing explanations, Applicant respectfully requests that the Examiner reconsider and reexamine the present application, allow claims 1-4, 7-11, 14-18 and 20-23 and pass the application to issue.

**Appl. No. 10/544,143  
Amendment and/or Response  
In Reply to Office Action of March 3, 2009**

In the event that there are any outstanding matters remaining in the present application, the Examiner is invited to contact Van C. Ernest (Reg. No. 44,099) at (571) 283.0720 to discuss these matters.

Respectfully submitted on behalf of:

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